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cludes seven species, *N. mexicana* (Florida, Texas, Mexico), *N. tetragona* (eastern Europe, Asia, North America to Australia), *N. fennica* (Finland), *N. candida* (northern Europe and Asia), *N. alba* (Europe and North Africa), *N. odorata* (eastern United States), and *N. tuberosa* (central United States); the subgenus *Lotos*, four species, *N. lotus* (Egypt), *N. zenkeri* (Africa), *N. pubescens* (East Indies), and *N. rubra* (East Indies); the subgenus *Hydrocallis*, ten species, *N. amazonum* (tropical America), *N. rudgeana* (tropical America), *N. blanda* (Guatemala), *N. lasiophylla* (Brazil), *N. gardneriana* (Brazil), *N. jamesoniana* (western South America and Porto Rico), *N. stenaspidota* (Brazil), *N. tenerinerva* (Brazil), *N. oxypetala* (Equador) and *N. gibertii* (Paraguay). It is noteworthy in this day when almost every monographer finds a lot of new species in his material, as a matter of course, that Doctor Conard describes but one new species, viz., *N. ovalifolia*, and a few new varieties. A second new species, *N. zenkeri*, by Professor Gilg, of Berlin, is here printed for the first time, although the name has been used for some time in European herbaria.

The closing chapter, mostly devoted to cultural directions, can scarcely be read without making one want to undertake the growth of some of these interesting plants. Beginning with such suggestions as 'the care of them is very simple; the pond or tank may be only a large bucket or a half barrel,' Doctor Conard proceeds to more and more elaborate suggestions, some of which can not fail to tempt his readers to make a beginning in their cultivation.

The author is to be congratulated upon having made such a notable contribution to botanical science.

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*American Insects.* By VERNON L. KELLOGG, Professor of Entomology and Lecturer on Bionomics in the Leland Stanford Jr. University. New York, Henry Holt & Co. 1905. Pp. 674.

In recent years a good many text-books or general works on the insects of America have

been published. Several of these have been limited to special fields, such as 'The Butterfly Book' and 'The Moth Book,' by Dr. Holland, and 'The Insect Book,' by Dr. Howard, the latter a companion book to Dr. Holland's volumes, covering the other orders of insects excepting the Coleoptera. Several text-books have, however, included the whole subject, among which may be mentioned Comstock's 'Manual for the Study of Insects,' Packard's 'Text-book of Entomology,' and volumes relating to insects more particularly in economic relations, such as Smith's 'Economic Entomology,' and Sanderson's 'Insects Affecting Staple Crops.' The best foreign work in English covering the general subject is Dr. Sharp's two volumes on insects in the Cambridge Natural History series, which remains the best work of its kind so far produced. Dr. Sharp's work, however, applies to the insects of the world. The volume prepared by Professor Kellogg, as indicated in the title, is limited practically to American insects, and is somewhat broader in scope than any of the American text-books so far published. The insect field in all its relations is so vast that it becomes a very difficult problem to include it even in a general way in a single volume, but Professor Kellogg has accomplished this very satisfactorily, on the whole.

As indicated in his preface:

This book is written in the endeavor to foster an interest in insect biology on the part of students of natural history, of nature observers and of general readers; it provides in a single volume a general systematic account of all the principal groups of insects as they occur in America, together with special accounts of the structure, physiology, development and metamorphoses, and of certain particularly interesting and important ecological relations of insects with the world around them. Systematic entomology, economic entomology, and what many be called the bionomics of insects are the special subjects of the matter and illustration of the book.

The structure and physiology of insects is gone into in considerable detail in the opening chapter. Metamorphosis and systematic classification of insects are rather briefly considered. The different orders and families of insects are then taken up seriatim, from the

lowest to the highest, and the structural characteristics, habits and transformations are discussed in some detail for the more important representatives of each family. The work includes also supplementary chapters on the relation of insects to flowers and the fertilization of plants, color and pattern and their uses, including also a discussion of protective resemblance, warning colors, mimicry, etc., and a chapter on the relation of insects to disease, discussing in some detail the relation of mosquitoes to malaria, yellow fever and filariasis. An appendix covers the general subject of collecting and rearing insects. The scope of the volume, therefore, is seen to be a very broad one. In some respects it reminds one of Dr. Sharp's excellent work, but falls short of the English publication in the character of the illustrations and in the general dignity of style. Professor Kellogg's work is designated apparently to arouse popular interest in the subject, and is somewhat uneven in style, varying from popular statement with an occasional indulgence in the rhapsody of the nature lover, to very technical and scientific matter.

The illustrations are very copious, including some 812 text figures and 13 plates, the latter mostly color-process reproductions from photographs. There are also many purely decorative figures. The text illustrations serve their purpose very well in supplementing the descriptive matter, but are of very unequal quality. Many of them are original, the work of Miss Mary Wellman; but many others are reproductions from standard European and other works and from the publications of various experiment station and other entomologists of this country. Very often old figures have been thus copied where much more accurate and better ones could have been substituted. Much of this reproduction and copying has evidently been done by means of photo-processes, and the result is rather unfortunate, especially in the case of the smaller figures, which are often mere blotches of black or at least have lost much of the structural detail which they originally possessed. The colored plates are most of them very good, and will enable the ready

recognition of the insects portrayed. The excuse is doubtless a valid one that, in a work as numerously illustrated as is this, the question of expense renders impracticable the careful preparation of all the illustrations.

Synoptical tables or keys to the different orders and families of insects are given throughout the book which will enable the student, with the aid of the illustrations, to form at least a rough classification of his collections.

An examination of the subject matter of the different chapters shows considerable care in getting the main facts and putting the information into semipopular language which may be readily understood by the student. While necessarily very largely a compilation, personal studies of the author in various special subjects greatly enrich the volume and give it freshness and originality. A great deal of interesting matter is thus contained in the volume, and the information given is reliable and correct as a whole. One notes, however, occasional errors of statement, evidently resulting from haste in the preparation of the work or careless compilation from original sources. For example, in the discussion of the fig insect, the *Blastophaga* is stated to have been imported directly from Asia Minor to California, when, in point of fact, the successful importations were from Algeria. In the discussion of luminosity of insects the matter is given a final status which is far from warranted by present knowledge of this interesting phenomenon. In the nomenclature the author has not followed the latest information, but in this particular he is perhaps justified, owing to the uncertain status of insect nomenclature and the frequent changes which are taking place, especially in the names of different genera. Some of the names employed can not, however, be excused on these grounds, and perpetuate old errors which have long been corrected in modern literature. The volume has no list of illustrations, but has a very full and useful index. The minor defects noted detract little from its real value, and Professor Kellogg's volume will be welcomed as one of the best general text-books on the subject covered. C. L. MARLATT.